(c) A sample of airborne dust, designated as a test sample, shall be collected in the breathing zone of the drill operators during the drilling of each test hole. Time consumed in changing drill steel shall not be considered as drilling time and sampling shall be discontinued during such periods.

[Sched. 25B, 25 FR 6473, July 9, 1960, as amended at 26 FR 2599, Mar. 28, 1961]

§ 33.33 Allowable limits of dust concentration.

(a) The concentration of dust determined by the control sample shall be subtracted from the average concentration of dust determined by the test samples collected at each drill operator's position, and the difference shall be designated as the net concentration of airborne dust. Calculations of the average concentration of dust determined from the test samples shall be based upon the results of not less than 80 percent of each set of test samples.

(b) Under each prescribed test condition, the net concentration of airborne dust at each drill operator's position shall not exceed 10 million particles (5 microns or less in diameter) per cubic foot of air when determined in accordance with the method given in § 33.32(a).

[Sched. 25B, 25 FR 6473, July 9, 1960, as amended at 26 FR 2599, Mar. 28, 1961]

§ 33.34 Drilling test.

(a) A drilling test shall consist of drilling a set of 10 test holes, without undue delay, under specified operating conditions. When the test involves the control of dust from more than one drill, all the drills shall be used in the intended manner to complete the set of test holes.

(b) Holes shall be drilled to a depth of 4 feet plus or minus 2 inches and shall be spaced so as not to interfere with adjacent holes. Each hole may be plugged after completion.

(c) Receptacles and filters for collecting drill cuttings shall be emptied and cleaned before each drilling test is started.

(d) Holes designated as ''vertical'' shall be drilled to incline not more than 10 degrees to the vertical. Holes designated as ''angle'' shall be drilled to incline not less than 30 and not more than 45 degrees to the vertical. Holes designated as ''horizontal'' shall be drilled to incline not more than 15 degrees to the horizontal.

[Sched. 25B, 25 FR 6473, July 9, 1960, as amended at 26 FR 2599, Mar. 28, 1961]

§ 33.35 Methods of drilling; dust-collector unit.

(a) *General.* All drilling shall be done with conventional, commercial drilling equipment—pneumatic-percussion, hydraulic-rotary, and/or electric-rotary types—in accordance with the applicant's specifications.

(b) *Pneumatic-percussion drilling.* A stoper-type drill with a piston diameter of 2½ to 3 inches shall be used for roof drilling, A hand-held, sinker-type drill with a piston diameter of 2½ to 3 inches shall be used for down drilling and also for horizontal drilling, except that the drill shall be supported mechanically. Compressed air for operating the drill shall be supplied at a gage pressure of 85–95 pounds per square inch. Drill bits shall be detachable, cross type with hard inserts, and shall be sharp when starting to drill each set of 10 holes. In roof drilling, 1¼- and 1½-inch diameter drill bits shall be used; in horizontal and down drilling, 1¾-inch diameter bits shall be used. The drill steel shall be ⅞-inch hexagonal and of hollow type to permit the introduction of compressed air through the drill steel when necessary to clean a hole during drilling.

(c) *Rotary drilling.* A hydraulic-rotary drill with a rated drilling speed of 18 feet per minute free lift, capable of rotating drill steel at 900 revolutions per minute with 100 foot-pounds torque, and having a feed force of 7,000 pounds, shall be used for roof drilling. An electric-rotary drill, supported by a post mounting, with a rated drilling speed of 30 inches per minute and powered by a 2.25 horsepower motor, shall be used for horizontal drilling. For roof drilling, the bits shall be hard-tipped, 1⅜ and 1½ inches outside diameter, and 1¼-inch auger-type drill steel shall be used. For horizontal drilling, the bits shall be hard-tipped, 2 inches outside diameter, and 1¾-inch auger-type drill steel shall be used. Drill bits shall be